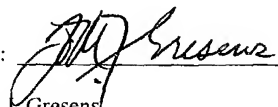


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JC09 Rec'd PCT/PTO 11 DEC 2001

FORM PTO-1390 (REV 10-94)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY'S DOCKET NUMBER 9424.168USWO
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371			U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.5) Unknown 10/009853
INTERNATIONAL APPLICATION NO. PCT/NL00/00427	INTERNATIONAL FILING DATE June 20, 2000	PRIORITY DATE CLAIMED June 21, 1999	
TITLE OF INVENTION DOSING DEVICE ADAPTED FOR DISPENSING A CONCENTRATE FROM A HOLDER IN A METERED MANNER			
APPLICANT(S) FOR DO/EO/US Paul Isordore D'HOND and Albertus Maria BRAMER			
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:			
<ol style="list-style-type: none">1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.3. <input checked="" type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(I).4. <input checked="" type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2))<ol style="list-style-type: none">a. <input checked="" type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau).b. <input checked="" type="checkbox"/> has been transmitted by the International Bureau.c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US)6. <input type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)).7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))<ol style="list-style-type: none">a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau).b. <input type="checkbox"/> have been transmitted by the International Bureau.c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.d. <input checked="" type="checkbox"/> have not been made and will not be made.8. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).9. <input checked="" type="checkbox"/> An unsigned oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).10. <input type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).			
Items 11. to 16. below concern document(s) or information included:			
<ol style="list-style-type: none">11. <input type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.13. <input checked="" type="checkbox"/> A FIRST preliminary amendment. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment.14. <input type="checkbox"/> A substitute specification.15. <input type="checkbox"/> A change of power of attorney and/or address letter.16. <input checked="" type="checkbox"/> Other items or information: PCT/IPEA/409; PCT/ISA/210; Marked-up Copy of Claims			

U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.5) Unknown 10/U09853		INTERNATIONAL APPLICATION NO. PCT/NL00/00427		ATTORNEY'S DOCKET NUMBER 9424.168USWO	
17. [X] The following fees are submitted: BASIC NATIONAL FEE (37 CFR 1.492(a) (1)-(5)): Search Report has been prepared by the EPO or JPO.....\$890.00 International preliminary examination fee paid to USPTO (37 CFR 1.492(a)(1)).....\$710.00 No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)).....\$740.00 Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(3)) paid to USPTO \$1040.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4)\$100.00				CALCULATIONS PTO USE ONLY	
ENTER APPROPRIATE BASIC FEE AMOUNT =				\$890.00	
Surcharge of \$130.00 for furnishing the oath or declaration later than [] 20 [] 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	24 -20 = 4		X \$18.00	\$72.00	
Independent claims	1 -3 = 0		X \$84.00	\$	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$260.00	\$	
TOTAL OF ABOVE CALCULATIONS =				\$962.00	
Reduction by 1/2 for filing by small entity, if applicable. Small entity status is claimed pursuant to 37 CFR 1.27				\$	
SUBTOTAL =				\$962.00	
Processing fee of \$130.00 for furnishing the English translation later than [] 20 [] 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				+ \$	
TOTAL NATIONAL FEE =				\$962.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property				+ \$	
TOTAL FEES ENCLOSED =				\$962.00	
				Amount to be: refunded	\$
				charged	\$
a. [X] Check(s) in the amount of \$962.00 to cover the above fees is enclosed. b. [] Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed. c. [X] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 13-2725.					
NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.					
SEND ALL CORRESPONDENCE TO: John J. Gresens MERCHANT & GOULD P.O. Box 2903 Minneapolis, MN 55402-0903					
			SIGNATURE:  NAME: John J. Gresens REGISTRATION NUMBER: 33,112		

10009853-070102
10/009853
JC13 Rec'd PCT/PTO 1.1 DEC 2001

S/N unknown

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	D'HOND et al.	Docket No.:	9424.168USWO
Serial No.:	unknown	Filed:	concurrent herewith
Int'l Appln No.:	PCT/NL00/00427	Int'l Filing Date:	June 20, 2000
Title:	DOSING DEVICE ADAPTED FOR DISPENSING A CONCENTRATE FROM A HOLDER IN A METERED MANNER		

CERTIFICATE UNDER 37 CFR 1.10

'Express Mail' mailing label number: EL 669945240 US

Date of Deposit: December 11, 2001

I hereby certify that this correspondence is being deposited with the United States Postal Service 'Express Mail Post Office To Addressee' service under 37 CFR 1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

By: 

Name: Chris Stordahl

PRELIMINARY AMENDMENT

Box PCT
Assistant Commissioner for Patents
Washington, D. C. 20231

Dear Sir:

In connection with the above-identified application filed herewith, please enter the following preliminary amendment, which is based on the Article 34 amendments, based on specification and claims amended in prosecution of the international application and published in the International Preliminary Examination Report, a copy of which is enclosed herewith:

IN THE ABSTRACT

Insert the attached Abstract page into the application as the last page thereof.

IN THE SPECIFICATION

A courtesy copy of the present specification is enclosed herewith. The first two pages of which have been amended during the prosecution of the international application. However, the World Intellectual Property Office (WIPO) copy should be relied upon if it is already in the U.S. Patent Office.

IN THE CLAIMS

Please amend the claims as set forth in the Article 34 Amendment to read as follows:

3. (AMENDED) A dosing device according to claim 1, characterized in that the housing of the dosing device is substantially rotation-symmetrical design, with an axial axis of the housing extending in the direction from the inlet to the outlet.
4. (AMENDED) A dosing device according to claim 1, characterized in that the dosing device is provided, downstream of the gear pump, with a valve included in the liquid flow path, which opens when the liquid pressure upstream of the valve exceeds a predetermined threshold valve.
5. (AMENDED) A dosing device according to claim 1, characterized in that the dosing device comprises a rotor rotatably connected to the housing for rotation around a rotation axis, for causing the rotor to rotate about the rotation axis by means of at least one changing magnetic field, the rotor being mechanically connected to the gear pump for driving the gear pump with the rotating rotor.

9. (AMENDED) A dosing device according to claim 5, characterized in that the rotor is provided with a magnetizable material such as soft iron.
10. (AMENDED) A dosing device according to claim 5, characterized in that the rotor comprises a permanent magnet for contactlessly driving the rotor by means of at least one changing magnetic field.
11. (AMENDED) A dosing device according to claim 5, characterized in that the rotor comprises a plurality of arms extending in radial direction of the rotation axis.
12. (AMENDED) A dosing device according to claim 10, characterized in that the ends of the arms form poles of the permanent magnet.
13. (AMENDED) A holder filled with concentrate which in diluted form is suitable for consumption, the holder comprising a dosing device according to claim 1.
16. (AMENDED) A holder according to claim 13, characterized in that the housing is of more rigid design than the bag.
17. (AMENDED) An apparatus for preparing a beverage suitable for consumption, the apparatus being adapted to be loaded with a holder according to claim 13 which is fitted with a dosing device characterized in that the dosing device comprises a rotor rotatably connected to the housing for rotation around a rotation axis, for causing the rotor to rotate about the rotation axis by means of at least one changing magnetic field, the rotor being mechanically connected to the gear pump for driving the gear pump with the rotating rotor, the apparatus comprising a magnetization unit for generating at least one magnetic field changing such that the rotor is contactlessly driven by the magnetization unit for the dosing device to dispense concentrate from the holder in a metered manner, and means for diluting the dispensed concentrate with water for obtaining the beverage suitable for consumption.

20. (AMENDED) An assembly comprising an apparatus for preparing a beverage suitable for consumption and a holder according to claim 13, the apparatus comprising driving means for driving the dosing device for the dosing device to dispense concentrate from the holder in a metered manner, and means for diluting the dispensed concentrate with water for obtaining the beverage suitable for consumption.

22. (AMENDED) An assembly according to claim 20, wherein the holder comprises a dosing device characterized in that the dosing device comprises a rotor rotatably connected to the housing for rotation around a rotation axis, for causing the rotor to rotate about the rotation axis by means of at least one changing magnetic field, the rotor being mechanically connected to the gear pump for driving the gear pump with the rotating rotor, characterized in that the apparatus further comprises a magnetization unit for generating at least one magnetic field changing such that the rotor is driven for causing the dosing device to dispense concentrate from the holder.

REMARKS

The above preliminary amendment is made to add amended pages 1-2 of the specification and to remove multiple dependencies from claims 3-7, 9-13, 16, 17, 20, 22.

A new abstract page is supplied to conform to that appearing on the publication page of the WIPO application, but the new Abstract is typed on a separate page as required by U.S. practice.


Applicants respectfully request that the preliminary amendment described herein be entered into the record prior to calculation of the filing fee and prior to examination and consideration of the above-identified application.

If a telephone conference would be helpful in resolving any issues concerning this communication, please contact Applicants' primary attorney-of record, John J. Gresens (Reg. No. 33,112), at (612) 33,112.

Respectfully submitted,

MERCHANT & GOULD P.C.
P.O. Box 2903
Minneapolis, Minnesota 55402-0903
(612) 332-5300

Dated: December 11, 2001

By 
John J. Gresens
Reg. No. 33,112

JJG/pjk

ABSTRACT

The invention relates to a dosing device comprising a housing comprising at least one inlet, at least one outlet, and a liquid flow path extending from the inlet to the outlet. The dosing device is adapted for dispensing in a metered manner a viscous concentrate from a holder. The concentrate in diluted condition forms a beverage suitable for consumption. The dosing device is adapted to be connected, in use, to a storage space of the holder. According to the invention, the dosing device comprises a gear pump to be included in the liquid flow path, which gear pump can be driven in particular by a rotor located upstream of the gear pump, by means of changing magnetic fields.

MARKED-UP COPY OF CLAIMS

3. A dosing device according to claim 1 [or 2], characterized in that the housing of the dosing device is substantially rotation-symmetrical design, with an axial axis of the housing extending in the direction from the inlet to the outlet.
4. A dosing device according to [any one of the preceding claims] claim 1, characterized in that the dosing device is provided, downstream of the gear pump, with a valve included in the liquid flow path, which opens when the liquid pressure upstream of the valve exceeds a predetermined threshold valve.
5. A dosing device according to [any one of the preceding claims] claim 1, characterized in that the dosing device comprises a rotor rotatably connected to the housing for rotation around a rotation axis, for causing the rotor to rotate about the rotation axis by means of at least one changing magnetic field, the rotor being mechanically connected to the gear pump for driving the gear pump with the rotating rotor.
7. A dosing device according to claim 5 [or 6], characterized in that the rotor is included in the liquid flow path.
9. A dosing device according to [any one of] claim[s] 5[-8], characterized in that the rotor is provided with a magnetizable material such as soft iron.
10. A dosing device according to [any one of] claim[s] 5[-9], characterized in that the rotor comprises a permanent magnet for contactlessly driving the rotor by means of at least one changing magnetic field.

11. A dosing device according to [any one of] claim[s] 5[-10], characterized in that the rotor comprises a plurality of arms extending in radial direction of the rotation axis.

12. A dosing device according to claim[s] 10 [and 11], characterized in that the ends of the arms form poles of the permanent magnet.

13. A holder filled with concentrate which in diluted form is suitable for consumption, the holder comprising a dosing device according to [any one of the preceding claims] claim 1.

16. A holder according to [any one of] claim[s] 13[-15], characterized in that the housing is of more rigid design than the bag.

17. An apparatus for preparing a beverage suitable for consumption, the apparatus being adapted to be loaded with a holder according to [any one of the preceding] claim[s] 13[-16] which is fitted with a dosing device [according to any one of claims 5-12] characterized in that the dosing device comprises a rotor rotatably connected to the housing for rotation around a rotation axis, for causing the rotor to rotate about the rotation axis by means of at least one changing magnetic field, the rotor being mechanically connected to the gear pump for driving the gear pump with the rotating rotor, the apparatus comprising a magnetization unit for generating at least one magnetic field changing such that the rotor is contactlessly driven by the magnetization unit for the dosing device to dispense concentrate from the holder in a metered manner, and means for diluting the dispensed concentrate with water for obtaining the beverage suitable for consumption.

20. An assembly comprising an apparatus for preparing a beverage suitable for consumption and a holder according to [any one of the preceding] claim[s] 13[-16], the apparatus comprising driving means for driving the dosing device for the dosing device to dispense concentrate from the holder in a metered manner, and means for diluting the dispensed concentrate with water for obtaining the beverage suitable for consumption.

22. An assembly according to claim 20[or 21], wherein the holder comprises a dosing device [according to any one of claims 5-12] characterized in that the dosing device comprises a rotor rotatably connected to the housing for rotation around a rotation axis, for causing the rotor to rotate about the rotation axis by means of at least one changing magnetic field, the rotor being mechanically connected to the gear pump for driving the gear pump with the rotating rotor, characterized in that the apparatus further comprises a magnetization unit for generating at least one magnetic field changing such that the rotor is driven for causing the dosing device to dispense concentrate from the holder.

5/ptb

Title: Dosing device adapted for dispensing a concentrate from a holder in a metered manner.

This invention relates to a dosing device comprising a housing comprising at least one inlet, at least one outlet, a liquid flow path extending from the inlet to the outlet, and a pump included in the liquid flow path, the dosing device being adapted for dispensing in a metered manner a viscous concentrate from a holder in which the concentrate is contained, the concentrate in diluted form giving a product suitable for consumption, the holder comprising a storage space in which the concentrate is contained, and the inlet of the dosing device being adapted to be connected, in use, to the storage space of the holder.

Such a device is known from British patent application 2103296. The dosing device described therein comprises a hollow cylinder-shaped body manufactured from a flexible elastic material. The body in question encloses a pumping volume. Further, the device comprises an operating element for compressing the body in an axial direction. The device also comprises a hollow cylinder-shaped housing which is adapted to encompass said body on its outer side at least during the phase in which the pumping volume is reduced. The flexible body is cyclically deformed in an axial direction, with the result that in each cycle a predetermined amount of extract is dispensed. To that end, the operating element is driven by means of a pulsating magnetic field. For driving the operating element, the dosing device is placed in a unit for generating a pulsating magnetic field. In a pulsating magnetic drive, the position of the dosing device with respect to the unit in axial direction of the dosing device is of great influence on the power to be supplied. This makes placing the dosing device in the unit very critical.

Further, the known dosing device has as a disadvantage that its action is dependent on the viscosity of the concentrate.

The object of the invention is to provide an improved dosing device. To that end, the dosing device according to the invention is characterized in that the pump comprises a gear pump.

As the dosing device comprises a gear pump included in the liquid flow path, it is no longer necessary, as in the known device, to utilize a pulsating drive. Because a pulsating drive can be omitted, the placement of the dosing device in a dispensing machine is no longer critical. A further advantage is that in the diluted form of the concentrate, the so-called zebra effect does not arise because the concentrate is not dispensed in a pulsating manner.

Further, by virtue of the gear pump, the dosing device can be of economically advantageous construction.

A further advantage of the device according to the invention is that metering can be set steplessly. Furthermore, the gear pump can be arranged such that the rotation axis of each gear pump is directed approximately parallel to the direction of the liquid flow path. Such a construction is easy to realize. Moreover, the dosing device can be designed with small overall dimensions.

According to a more advanced embodiment, the dosing device is provided, upstream of the gear pump, with a rotor mechanically connected to the gear pump, for driving the gear pump using a changing magnetic field. Preferably the rotor is connected to the drive shaft for driving the gear pump.

An advantage is that the rotor can be included in the liquid flow path, so that this also obtains the function of stirrer. In particular, the dosing device is driven by a drive shaft of which an axial axis is directed in the direction from the inlet to the outlet. As a dynamic liquid sealing of the drive shaft can be omitted, there is relatively little energy loss and there is a very small chance of leakage or contamination. A further advantage is that

the concentrate remaining behind in the dosing device after use is hermetically sealed from the outside world.

What is also achieved by virtue of the specific direction of the drive shaft is that the dosing device can be placed in a dispensing machine rotation-independently. The position of the rotor is not critical then. If the dosing device is connected to a holder filled with the concentrate, this connection can likewise be effected rotation-independently.

According to the preferred embodiment, the dosing device comprises a substantially rotation-symmetrical housing of which an axial axis extends in the direction from the inlet to the outlet. In particular, the dosing device is provided, downstream of the gear pump, with a valve included in the liquid flow path which opens when the liquid pressure upstream of the valve exceeds a predetermined threshold value. The use of a gear pump in combination with a pressure relief valve has the advantage that no leakage flow owing to internal play arises in the non-driven condition. Moreover, the valve provides for a microbiological sealing, which is important for beverages suitable for consumption.

The holder according to the invention is characterized in that it is filled with the concentrate which in diluted condition is suitable for consumption, the holder being fitted with a dosing device according to the invention as described hereinbefore.

As the dosing device according to the invention, viewed in axial direction, can be made of low design, less length, viewed in this direction, is needed for driving than in the known linear magnet. This creates the possibility of making the dosing device extendible instead of foldable, so that a tearing strip in the holder, when it is designed as a so-called bag in box, can be omitted. This provides the advantage that making the bag in box operational involves a simpler operation. In particular, accordingly, the holder is provided with a bag formed from flexible sheetlike material, in

which the concentrate is contained, and a housing in which the bag is accommodated.

The invention also relates to an apparatus for preparing a beverage suitable for consumption, the apparatus being adapted to be charged with a holder as mentioned hereinbefore. The apparatus comprises a magnetization unit for generating at least one magnetic field which changes so as to drive the rotor to allow the dosing device to dispense concentrate from the holder in a metered manner. The apparatus further comprises means for diluting the dispensed concentrate with water for obtaining the beverage suitable for consumption. The magnetization unit can be provided with a magnet and driving means for rotating a magnet for generating the changing magnetic field. It is also possible, however, that the magnetization unit is provided with a plurality of coils for generating the changing magnetic field. The invention also relates to an assembly comprising an apparatus for preparing a beverage suitable for consumption and a holder as described hereinbefore. The apparatus is adapted to be loaded with the holder, the apparatus comprising driving means for driving the dosing device to cause the dosing device to dispense concentrate from the holder in a metered manner, and means for diluting the dispensed concentrate with water for obtaining the beverage suitable for consumption.

The invention will presently be further explained with reference to the drawings, in which:

Fig. 1 shows an exploded view of a possible embodiment of a dosing device according to the invention, which is connected to a holder according to the invention. Fig. 1 also shows a magnetization unit of an apparatus for preparing a beverage suitable for consumption;

Fig. 2 shows a number of parts of the dosing device according to Fig. 1;

Fig. 3 shows a number of parts of the dosing device and the apparatus for preparing a beverage suitable for consumption according to Fig. 1;

Fig. 4a shows a top plan view of the gear pump of the dosing device according to Fig. 1;

Fig. 4b shows a cross section of the dosing device according to Fig. 1 which is placed in the magnetization unit of Fig. 1;

Fig. 5a shows a top plan view of the dosing device according to Fig. 1 which is placed in the magnetization unit according to Fig. 1;

Fig. 5b shows a view of the dosing device according to Fig. 1 which is placed in the magnetization unit according to Fig. 1; and

Fig. 6 shows a holder with a dosing device according to the invention, an apparatus for preparing a beverage suitable for consumption according to the invention, and an assembly comprising the apparatus and the holder according to the invention.

In Figs. 1-6, reference numeral 1 indicates a dosing device according to the invention. The dosing device comprises an inlet 2 and at least one outlet 4.

The liquid flow path extends from the inlet 2 to the outlet 4. In this example, the dosing device comprises a housing 6a and 6b composed of two parts, which is rotation-symmetrical around an axis which is directed in the direction of the liquid flow path.

In the housing 6a, 6b, a gear pump 8 is included. At the top, the gear pump 8 comprises a covering plate 10 having an inflow opening 12. The inflow opening 12 is in fluid communication with a space where the teeth of, in this case two, gearwheels 14a and 14b mesh. The gearwheel 14b is driven by a drive shaft 16 which in mounted condition extends through an opening 18 of the covering plate 10. The drive shaft 16 can be driven directly by means of an external drive, for rotation of the gear pump. The gear pump 8 is provided at its underside with an outflow opening 20 for dispensing

liquid. The drive shaft 16 is so directed that an axial axis of this drive shaft is directed in the direction from the inlet 2 to the outlet 4. In this example, the housing 6a, 6b is designed to be substantially rotation-symmetrical around the axial axis, likewise extending in the direction from the inlet 2 to the outlet 4.

In this example, however, the dosing device is provided, upstream of the gear pump 8, with a rotor 22 connected mechanically with the gear pump, in this example connected mechanically with the rotary shaft 16. In mounted condition, this rotor 22 is disposed above the covering plate 10.

The rotor can be driven by means of an external drive for rotating the gear pump 8. Preferably, the rotor is adapted to be driven by means of a changing magnetic field, for the purpose of driving the gear pump 8.

In this example it holds, further, that the rotor 22 is included in the liquid flow path mentioned. In this example, the rotor is provided with a permanent magnet for contactlessly driving the rotor by means of at least one varying magnetic field. In particular it holds, in this example, that the rotor comprises a plurality of arms 24 extending in radial direction of the rotation axis (drive shaft 16). More particularly, there are only two arms, disposed in line with each other and hence forming a beamlike body. The ends of the arms form poles of the permanent magnet mentioned. The poles of the permanent magnet will want to follow the changing magnetic field, which has as a result that the rotor and the drive shaft 16 will start to rotate. The device described up to this point works as follows. Suppose that the inlet 2 of the dosing device is connected to a holder 26, shown schematically in Figs. 1 and 6, in which an amount of concentrate, such as, for instance, coffee concentrate, is present. The holder 26, as shown best in Fig. 6, is fitted with the dosing device according to Fig. 1. In this example, the holder 26 includes a bag 28 (indicated by broken lines), formed by a flexible sheetlike material, in which the concentrate is contained, and a housing 30 in which the bag 28 is accommodated. The housing 30 is

preferably made of substantially rigid design and hence is more rigid than the bag 28. The inlet 2 of the dosing device is in fluid communication with the inside of the bag 28. By presently generating a magnetic field changing in a predetermined manner, the rotor 22 will start to rotate in a
5 predetermined manner. As a consequence, the gear pump 8 will likewise start to rotate, with the result that concentrate flows via the inflow opening 12 and the space between the teeth of the gearwheels to the outflow opening 20 mentioned. Thus the amount of concentrate dispensed in a metered manner corresponds with the angle of rotation through which the rotor 22 is
10 rotated. The relation is substantially linear.

In Fig. 6, reference numeral 31 designates an apparatus for preparing a beverage suitable for consumption. The apparatus 31 is adapted to be loaded with the holder 26. The apparatus 31 comprises a magnetization unit 32 for generating the changing magnetic field referred to
15 for driving the rotor. Further, the apparatus comprises means 34 for diluting the concentrate dispensed by the dosing device 1 with water. These means 34 comprise a hot water generator 36 and a mixing unit 38. In use, the housing 6a, 6b of the dosing device is inserted through an opening 40 of the magnetization device, such that the outlet 4 of the dosing device reaches
20 into an opening 42 of the mixing device 38. A control unit 44 of the apparatus 31 controls the magnetization unit 32 via line 45, such that a changing magnetic field is generated which causes the rotor 22 to rotate through a predetermined angle of rotation. As a result, from the holder 26 a predetermined amount of concentrate is dispensed to the mixing device 38.
25 The control unit 44 also activates the hot water unit 36 and the mixing unit 38 via respective electrical lines 46 and 48. As a result, hot water is sent from the hot water unit 36 to the mixing unit 38. In the mixing unit, the hot water is mixed with the dispensed concentrate, after which the concentrate, in diluted condition and hence in the condition of a beverage suitable for
30 consumption, leaves an outlet opening 50 of the apparatus 31.

In this example, the magnetization unit 32 comprises a plurality of coils 52 for generating the changing magnetic field.

The invention is not limited in any way to the embodiments outlined hereinabove. Thus, the rotor 22 may also be provided exclusively with soft iron. Magnetization of the rotor is then effected by the magnetic field of the magnetization unit 31. The rotor will want to orient in this changing magnetic field, so that the rotation is effected. The rotor 22 may also be driven, in a manner known per se, as is known for an eddy current motor. Upon rotation of the rotor, fly-back pulses arise in the coils 52 of the magnetization device which are not energized. These fly-back pulses can be utilized in the magnetization device in a manner known per se to determine the rotational position of the rotor. On the basis of this rotational position, a (feedback) control configuration known per se can be utilized.

It is also possible that the coils 52 are replaced by permanent magnets, these magnets being mechanically rotated for generating the changing magnetic field.

Further, in the outflow opening 20 referred to, a valve 54 may be included which opens when the liquid pressure upstream of the valve exceeds a predetermined threshold value. This involves a so-called non-return valve comprising a shut-off member 56 with a spring 58 which is schematically shown in this example.

In this example, the housing 6a and 6b is made of a suitable plastic. The gearwheels 14a and 14b and the drive shaft 16 are also made of plastic. The only metal part is therefore the rotor 22. It is also possible that the rotor is included in the liquid flow path downstream of the gear pump. The gear pump, instead of being driven by means of the rotor, can also be driven in a different manner. Thus, the gear pump can also be driven mechanically, by means of, for instance, a motor. This motor can then be a part of the apparatus 31. The valve 54 can also be designed as a so-called

step valve. Such variants are all understood to fall within the scope of the invention.

CLAIMS

1. A dosing device comprising a housing comprising at least one inlet, at least one outlet, a liquid flow path extending from the inlet to the outlet, and a pump included in the liquid flow path, the dosing device being adapted for dispensing in a metered manner a viscous concentrate from a holder in which the concentrate is contained, the concentrate in diluted form giving a product suitable for consumption, the holder comprising a storage space in which the concentrate is contained, and the inlet of the dosing device being adapted to be connected, in use, to the storage space of the holder, characterized in that the pump comprises a gear pump.
2. A dosing device according to claim 1, characterized in that the gear pump is driven by a drive shaft of which an axial axis extends in a direction from the inlet to the outlet .
3. A dosing device according to claim 1 or 2, characterized in that the housing of the dosing device is of substantially rotation-symmetrical design, with an axial axis of the housing extending in the direction from the inlet to the outlet.
4. A dosing device according to any one of the preceding claims, characterized in that the dosing device is provided, downstream of the gear pump, with a valve included in the liquid flow path, which opens when the liquid pressure upstream of the valve exceeds a predetermined threshold value.
5. A dosing device according to any one of the preceding claims, characterized in that the dosing device comprises a rotor rotatably connected to the housing for rotation around a rotation axis, for causing the rotor to rotate about the rotation axis by means of at least one changing magnetic field, the rotor being mechanically connected to the gear pump for driving the gear pump with the rotating rotor.

6. A dosing device according to claims 2 and 5, characterized in that the rotor is connected to the drive shaft for driving the gear pump.

7. A dosing device according to claim 5 or 6, characterized in that the rotor is included in the liquid flow path.

5 8. A dosing device according to claim 7, characterized in that the rotor is included in the liquid flow path upstream of the gear pump.

9. A dosing device according to any one of claims 5-8, characterized in that the rotor is provided with a magnetizable material such as soft iron.

10 10. A dosing device according to any one of claims 5-9, characterized in that the rotor comprises a permanent magnet for contactlessly driving the rotor by means of at least one changing magnetic field.

11. A dosing device according to any one of claims 5-10, characterized in that the rotor comprises a plurality of arms extending in radial direction of the rotation axis.

15 12. A dosing device according to claims 10 and 11, characterized in that the ends of the arms form poles of the permanent magnet.

13. A holder filled with concentrate which in diluted form is suitable for consumption, the holder comprising a dosing device according to any one of the preceding claims.

20 14. A holder according to claim 13, characterized in that the holder comprises a bag formed from a flexible sheetlike material in which the concentrate is contained, and a housing in which the bag is received.

15. A holder according to claim 14, characterized in that the inlet of the dosing device is connected to the bag.

25 16. A holder according to any one of claims 13-15, characterized in that the housing is of more rigid design than the bag.

17. An apparatus for preparing a beverage suitable for consumption, the apparatus being adapted to be loaded with a holder according to any one of the preceding claims 13-16 which is fitted with a dosing device according to
30 any one of claims 5-12, the apparatus comprising a magnetization unit for

generating at least one magnetic field changing such that the rotor is contactlessly driven by the magnetization unit for the dosing device to dispense concentrate from the holder in a metered manner, and means for diluting the dispensed concentrate with water for obtaining the beverage suitable for consumption.

18. An apparatus according to claim 17, characterized in that the magnetization unit comprises a magnet and driving means for rotating the magnet for generating the changing magnetic field.

19. An apparatus according to claim 17, characterized in that the magnetization unit comprises a plurality of coils.

20. An assembly comprising an apparatus for preparing a beverage suitable for consumption and a holder according to any one of the preceding claims 13-16, the apparatus being loaded with the holder, and the apparatus comprising driving means for driving the dosing device for the dosing device to dispense concentrate from the holder in a metered manner, and means for diluting the dispensed concentrate with water for obtaining the beverage suitable for consumption.

21. An assembly according to claim 20, characterized in that the holder is detachably connected to the apparatus.

22. An assembly according to claim 20 or 21, wherein the holder comprises a dosing device according to any one of claims 5-12, characterized in that the apparatus further comprises a magnetization unit for generating at least one magnetic field changing such that the rotor is driven for causing the dosing device to dispense concentrate from the holder.

23. An assembly according to claim 22, characterized in that the magnetization unit comprises a magnet and driving means for rotating the magnet for generating the changing magnetic field.

24. An assembly according to claim 22, characterized in that the magnetization unit comprises a plurality of coils.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
28 December 2000 (28.12.2000)

PCT

(10) International Publication Number
WO 00/79223 A2

(51) International Patent Classification⁷: G01F 11/22

(21) International Application Number: PCT/NL00/00427

(22) International Filing Date: 20 June 2000 (20.06.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
1012395 21 June 1999 (21.06.1999) NL
1013392 26 October 1999 (26.10.1999) NL
1013393 26 October 1999 (26.10.1999) NL

(71) Applicant (for all designated States except US): SARA LEE/DE N.V. [NL/NL]; Keulsekade 143, NL-3532 AA Utrecht (NL).

(72) Inventors; and

(75) Inventors/Applicants (for US only): BRAMER, Albertus, Maria [NL/NL]; Schaarland 10, NL-5663 JR Geldrop (NL). D'HOND, Paul, Isodore [NL/NL]; Berlijnseplein 47, NL-3332 SB Zwijndrecht (NL).

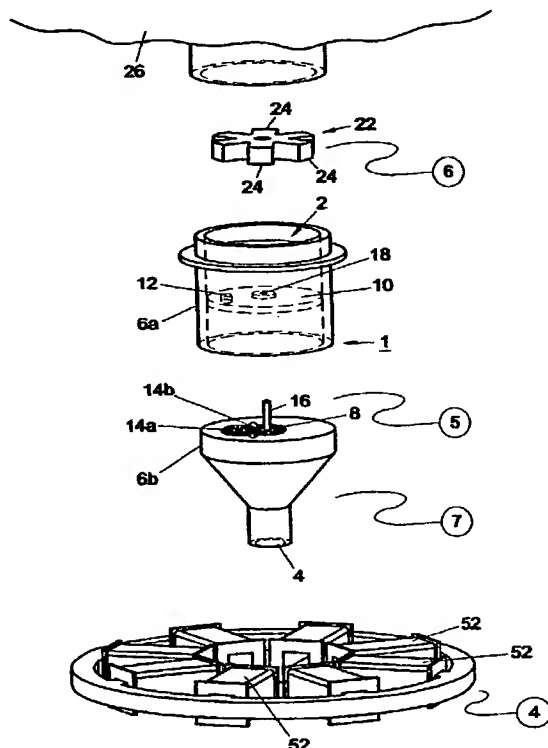
(74) Agent: PRINS, A., W.; Vereenigde, Nieuwe Parklaan 97, NL-2587 BN The Hague (NL).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian

[Continued on next page]

(54) Title: DOSING DEVICE ADAPTED FOR DISPENSING A CONCENTRATE FROM A HOLDER IN A METERED MANNER



(57) Abstract: The invention relates to a dosing device comprising a housing comprising at least one inlet, at least one outlet, and a liquid flow path extending from the inlet to the outlet. The dosing device is adapted for dispensing in a metered manner a viscous concentrate from a holder. The concentrate in diluted condition forms a beverage suitable for consumption. The dosing device is adapted to be connected, in use, to a storage space of the holder. According to the invention, the dosing device comprises a gear pump to be included in the liquid flow path, which gear pump can be driven in particular by a rotor located upstream of the gear pump, by means of changing magnetic fields.

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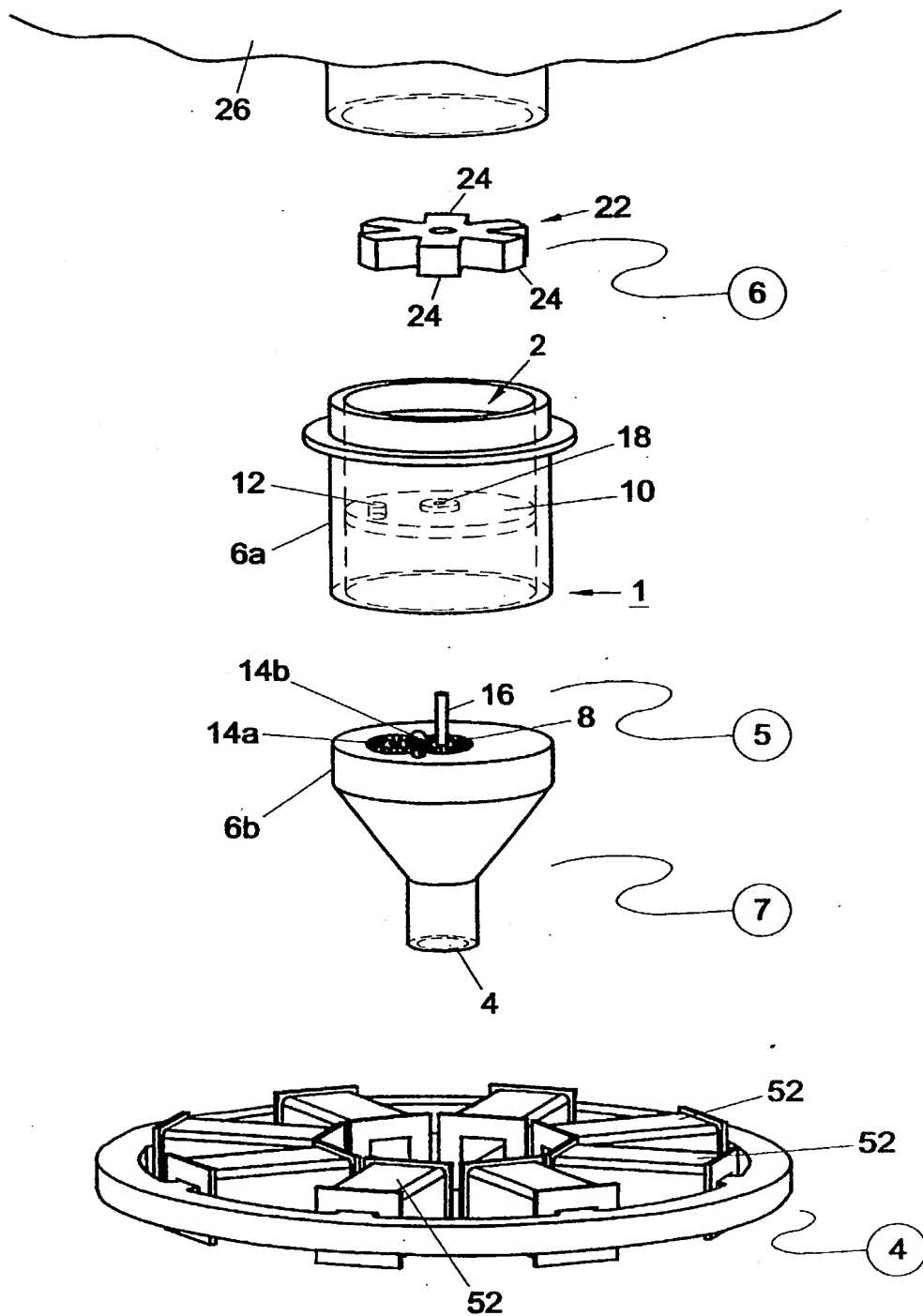


Fig. 1

WO 00/79223

Inventor: D'HOND et al.
Docket No.: 9424.168USWO
Title: DOSING DEVICE ADAPTED FOR DISPENSING A CONCENTRATE FROM A
HOLDER IN A METERED MANNER
Attorney Name: John J. Gresens
Phone No.: 612.371.5265
Sheet 2 of 5

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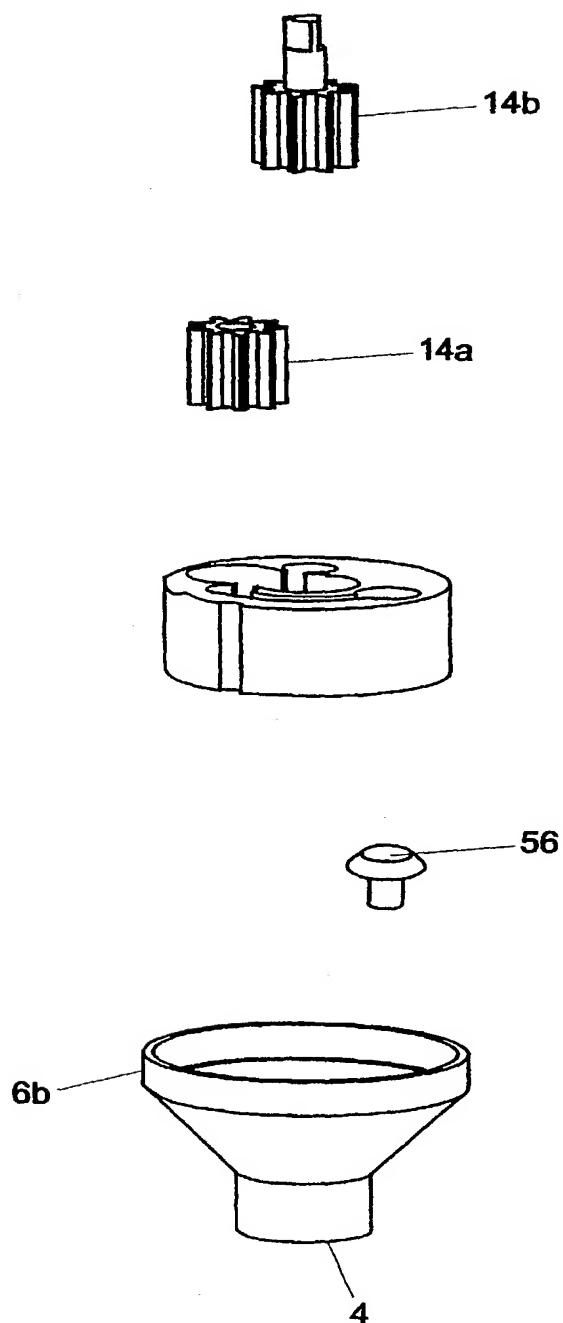
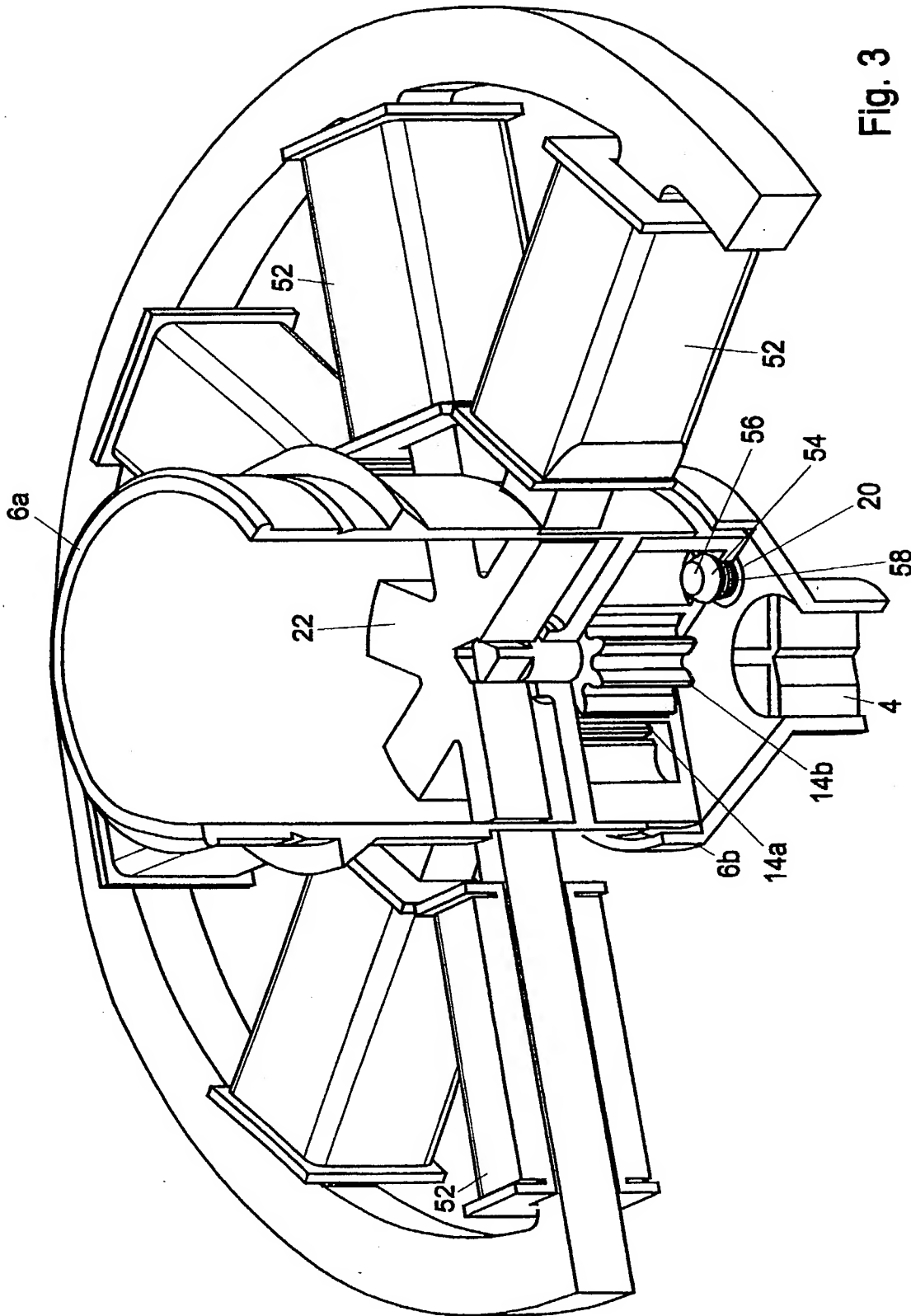


Fig. 2

Fig. 3



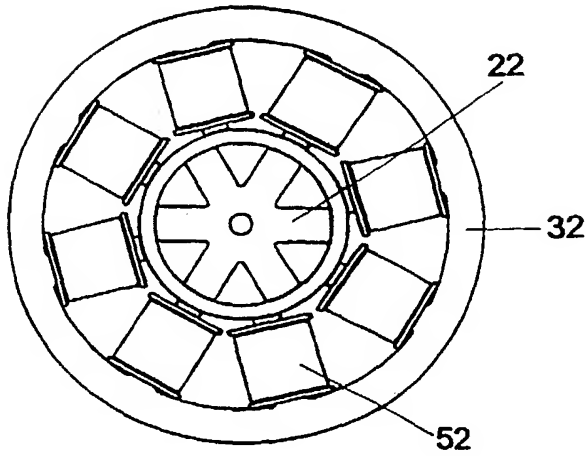


Fig. 5a

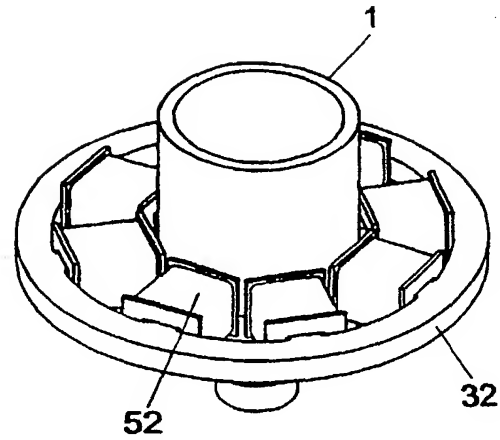


Fig. 5b

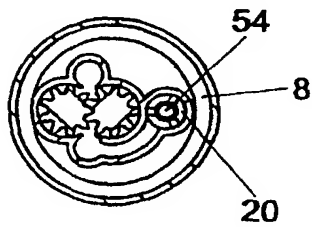


Fig. 4a

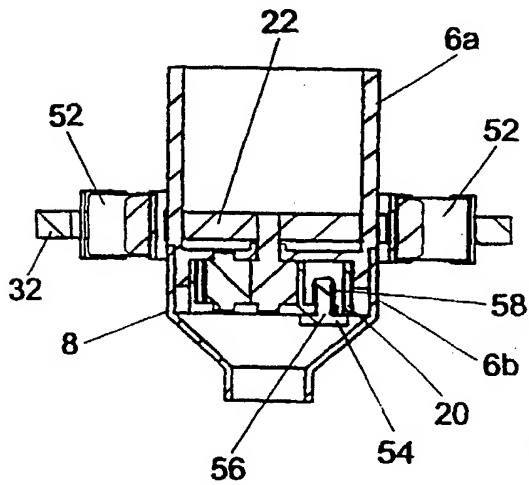
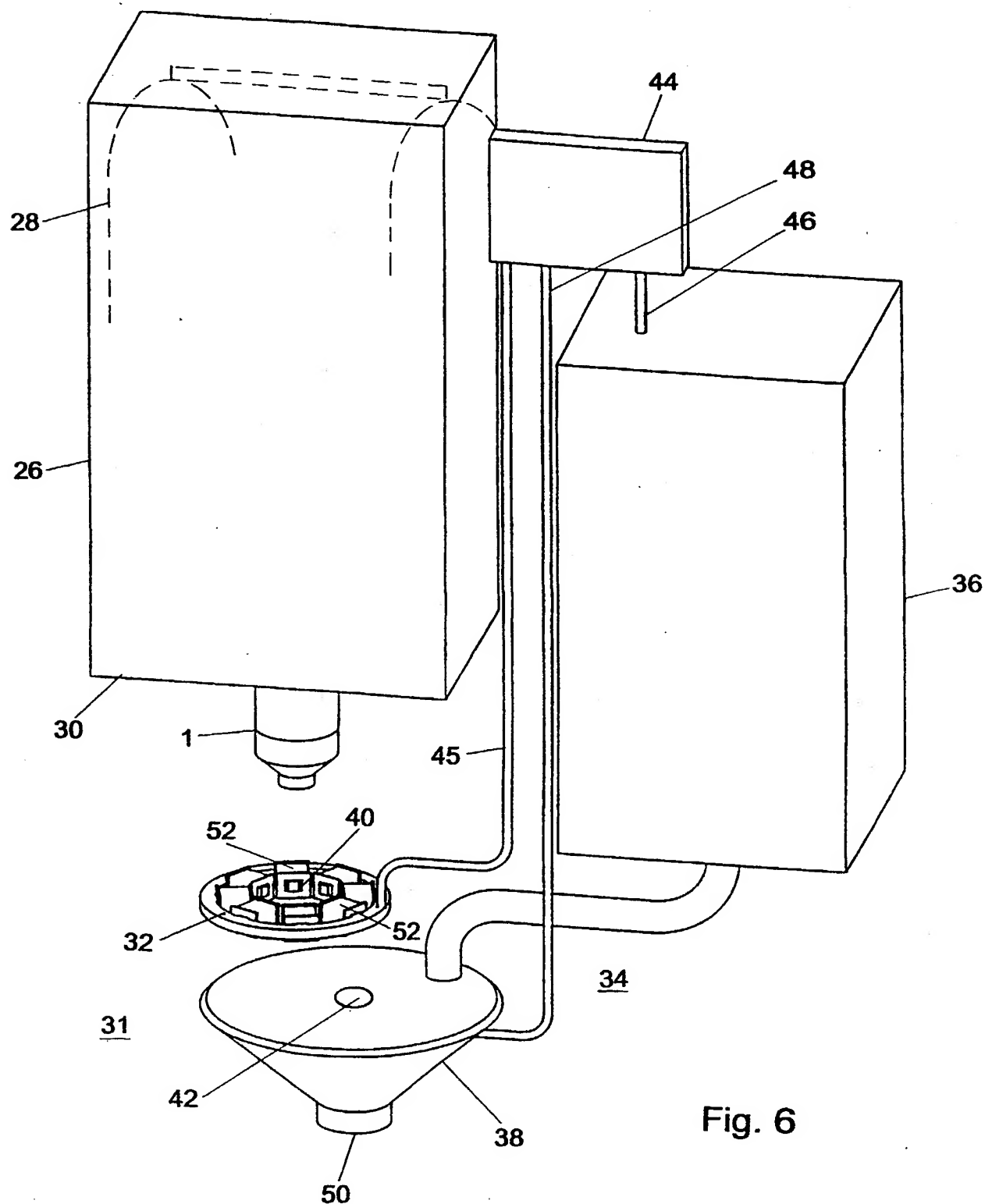


Fig. 4b





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As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: "Dosing device adapted for dispensing a concentrate from a holder in a metered manner".

the specification of which

- ☐ is attached hereto
☒ was filed on December 11, 2001 as application serial no. 10/009,853

and or PCT International Application number PCT/NL00/00427 and was amended on (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

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Prior Foreign Application(s)		
Number 1012395	Country NL	Day/Month/Year Filed 21 June 1999
Number 1013392	Country NL	Day/Month/Year Filed 26 October 1999
Number 1013393	Country NL	Day/Month/Year Filed 26 October 1999

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Andrew J. Leon	<u>46,869</u>
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Tong Wu	<u>43,361</u>
Min S. Xu	<u>39,536</u>
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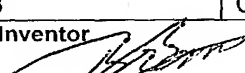
Please direct all correspondence in this case to at the address indicated below:

MERCHANT & GOULD P.C.
P.O. Box 2903
Minneapolis, Minnesota 55402-0903
United States of America

100

Full Name of Sole or First Inventor		
Family Name <u>d'Hond</u>	First Given Name <u>Paul</u>	Second Given Name <u>Isodore</u>
Residence and Citizenship		
City of Residence <u>Zwijndrecht</u>	State or Country of Residence <u>the Netherlands</u> <u>NLX</u>	Country of Citizenship <u>the Netherlands</u>
Post Office Address		
Street Address <u>Berlijnseplein 47</u>	City <u>Zwijndrecht</u>	State & Zip Code or Country <u>3332 SB</u>
Signature of Inventor 		Date <u>31-01-2002</u>

200

Full Name of Second Inventor, if any		
Family Name <u>Bramer</u>	First Given Name <u>Albertus</u>	Second Given Name <u>Maria</u>
Residence and Citizenship		
City of Residence <u>Culemborg</u>	State or Country of Residence <u>the Netherlands</u> <u>NLX</u>	Country of Citizenship <u>the Netherlands</u>
Post Office Address		
Street Address <u>Bikolaan 63</u>	City <u>Culemborg</u>	State & Zip Code or Country <u>4105 HB</u>
Signature of Inventor 		Date <u>30-1-2002</u>

Power of Attorney

As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

Attorney	Registration Number
John W. Albrecht	<u>40,481</u>
M. Jeffer Ali	<u>46,359</u>
Gregg I. Anderson	<u>28,828</u>
Brian H. Batzli	<u>32,960</u>
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